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| 10/571,181 | 03/09/2006 | **Matthias Viehmann** | 82520 | 9626 |

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| EXAMINER | |
|---|---|
| WILLIAMS, DON J | |
| **ART UNIT** | **PAPER NUMBER** |
| 2878 | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/571,181 | VIEHMANN, MATTHIAS | |
| | Examiner | Art Unit | |
| | DON WILLIAMS | 2878 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *3/9/2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/2/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tennies et al (5,185,685) in view of Neuhoff (4,067,052).

As to claim (1), Tennies et al disclose (fig. 1, fig. 2) at least one electrical conductor (46, 48, 50) formed as a single wire or multi-wire line or cable (46-50), which connects devices, subassemblies or circuits components (30, 54, 58, 60) of the piece of electrical equipment on one another, means (38) which guides the light that emerges when an arc is formed from the site of its formation to an optical/electrical transformer (26) and a monitoring and evaluating unit (62) electrically connected to the transformer (26) for evaluating the signals of transformer (26), is characterized in that the means (38) which guide the light that emerges when an arc is formed to an optical/electrical transformer (26) involve at least one conduit (38) which envelopes one or more wire cores of the electrical conductors (46-50) and thus simultaneously forms the electrical insulation of a line or the shielding of a cable, (column 3, lines 22-35, lines 45-57). Tennies et al is silent for explicitly disclosing an optical fiber. Neuhoff discloses (fig. 3) to provide for assured and more rapid conveyance of the light emanating from an arcing

fault, fiber optics may be utilized, for instance those fiber optics bundles represented at (136-140), extending to points of fault failure. Neuhoff also discloses that fiber optic bundles for use in such situations are known and available from such sources as Dolan-Jenner Industries, Inc, (column 7, lines 20-23). It would have been obvious for one of ordinary skill in the art to modify Tennies et al in view of Neuhoff to use the fiber optic bundle to envelope one or more wire cores of the electrical conductors to form the insulation and to improve the transmitting of arc faults at a faster rate by generating an electrical signal to open the circuit breaker in order to prevent damage to the equipment.

As to claim 2, Neuhoff discloses (fig. 3) that the arrangement responds to an arc, which originates from the electrical conductor whereby the light originating from the arc is coupled to the optical fiber (136-140) directly on the inside of the optical fiber (136-140), (column 3, lines 11-15, column 7, lines 5-8).

As to claim 3, Tennies et al disclose (fig. 2) the arrangement responds to an arc which arises at a contact site of electrical conductor (46-50) with other units (30, 54, 58, 60) of the piece of electrical equipment, this site being formed as a clamp or plug connection, whereby the optical fiber (38) is guided into the contact site and the light originating from the arc is coupled axially to a front surface of the optical fiber (38), (column 3, lines 30-32, lines 45-53).

As to claim 4, Tennies et al (fig. 1) disclose means (32-36) for disconnecting the current through the circuit components (30, 40, 42) of the piece of electrical equipment that are affected by the arc, and these means (32-36) are actuated or activated (fig. 2)

by the monitoring and evaluating unit (62) based on the detection of the arc, (column 3, lines 25-32).

As to claim 5, Tennies et al disclose (fig. 2) the optical fiber (38) enveloping the one or more wire cores of the electrical conductor (46-50) is enveloped by an additional electrically insulating cladding as illustrated in the break of the branch conduit (38), (column 3, lines 30-35).

As to claim 6, Tennies et al disclose (fig. 2) a conduit (38) which is used as an optical fiber, (column 3, lines 30-35). Tennies in view of Neuhoff is silent of explicitly disclosing light reflecting foil disposed on the inside of the optical fiber. It is well known in the art that the cladding of the optical fiber comprise of reflective properties. It would have been obvious for one of ordinary skill in the art to modify Tennies in view of Neuhoff to use the reflective properties of the inner cladding of the optical fiber to improve the rate of transmitting the arc resulting in disconnecting the circuit breaker in order to protect the equipment.

As to claim 7, Tennies et al disclose (fig. 2) an electrical conductor (46-50) that is uneven on its outer surface, further characterized in that the electrical conductor (46-50), (column 3, lines 32-35). Tennies et al in view of Neuhoff is silent of a compensating layer that is preferably light reflecting and arranged between it and the optical fiber in order to obtain an even surface. It is well known in the art for optical fibers to have reflective layers. It would have been obvious for one of ordinary skill in the art to modify Tennies in view of Neuhoff to use the reflective layers of the optical fiber to improve the

rate of transmitting the arc resulting in disconnecting the circuit breaker in order to protect the equipment.

As to claim 8, Tennies et al disclose (fig. 2) that the electrical conductors (46-50) that is structured as a wire or a cable is enveloped by several optical fibers (38) separated by intermediate layers, (column 3, lines 30-36).

As to claim 9, Tennies et al disclose (fig. 2) that the combination conductor (46-50) formed by the enveloping of the electrical conductor the optical fiber (38) is formed as a line that can be trimmed in its length, (column 3, lines 30-36).

As to claim 10, Tennies et al (fig. 2) disclose that the optical fiber (38) functioning simultaneously as insulation or shielding, (column 3, lines 30-36). Tennies in view of Neuhoff is silent of explicitly disclosing that the optical fiber is a polymer. Polymers are well known in the art for the formation of optical fibers. It would have been obvious for one of ordinary skill in the art to modify Tennies in view of Neuhoff to use the optical fiber as a polymer resulting in insulation used to encase the conductor wirings.

As to claims 11, 12, 13, Tennies et al disclose (fig. 2) an optical fiber (38), (column 3, lines 30-36). Tennies in view of Neuhoff is silent of explicitly disclosing that the optical fiber consist of polymethyl methacrylate, polymethylpentene, and polycarbonate. Polymers are well known in the art for the formation of optical fibers. It would have been obvious for one of ordinary skill in the art to modify Tennies in view of Neuhoff to use any type of polymer properties as claimed in order to form a durable optical fiber resulting in insulation used to encase the conductor wirings.

As to claim 14, Tennies et al disclose (fig. 4) filter (108) used for suppressing the effect of extraneous light are disposed on or in the optical/electrical transformer (26), (column 3, lines 22-23, column 4, lines 67).

As to claim 15, Neuhoff discloses (fig. 1) the optical/electrical transformer is constructed in the form of a cap (cabinet or enclosure) that can be attached to an axial end of the optical fiber (12, 14, 16, 18) or a disk that can be pushed open, whereupon the electrical conductor (12, 14, 16, 18) project through the cap (10) or the disk, (column 4, lines 18-22).

As to claim 16, Tennies et al disclose (fig.1, fig. 2) the optical/electrical transformer (26) and axial end of the optical fiber (38), (column 3, lines 25-35). Tennies in view of Neuhoff is silent of explicitly disclosing that the transformer can be screwed on. It would have been obvious for one of ordinary skill in the art to modify Tennies in view of Neuhoff to incorporate a transformer having threads that are used to screw the fiber end directly onto resulting in improving the arc transmission signal to the detector at a fast rate in order to open the breakers to eliminate further damage to the system.

As to claim 17, Tennies et al disclose (fig. 2) that the optical/electrical transformer (26) is sealed in the optical fiber (38), (column 3, lines 22-35).

As to claim 18, Tennies et al disclose the optical/electrical transformer (26) consist conduit (18), (column 3, lines 30-34). Tennies in view of Neuhoff is silent of explicitly disclosing that the optical fiber is a polymer. Polymers are well known in the art for the formation of optical fibers. It would have been obvious for one of ordinary skill in

the art to modify Tennies in view of Neuhoff to use the optical fiber as a polymer resulting in insulation used to encase the conductive wirings.

As to claim 19, Tennies et al disclose (fig. 2) that the optical fibers (38) of several electrical conductors (46-50) are guided onto an optical/electrical transformer (26), (column 3, lines 22-24, lines 30-35).

As to claim 20, Tennies et al disclose the optical/electrical transformer (26) is formed as an arc detector or transducer which constitutes a CCD line, (column 3, lines 45-47).

As to claim 21, Tennies et al disclose (fig. 4) fiber optical bundles (136-140) and that mirror surfaces (not shown) constitutes an optical fiber not sealed off by an optical/electrical transformer is mirror-coated of is provided with a reflecting cap, (column 7, lines 8-12).

As to claim 22, Neuhoff disclose (fig. 4) light generated by the arcing fault is transmitted by the fiber optic bundle (136-140) extending to points of probable fault failure and that mirror surfaces (not shown) ay be located along a side of a container or enclosure (142) constitutes the cap is formed as a semi-transparent mirror which is transparent to light emitted from the optical transmitter disposed in the cap, (column 7, lines 5-12).

As to claim 23, Tennies et al disclose that light intensifiers (arcs) are disposed in segments in optical fibers (136-140) with long line lengths, (column 7, lines 7-9).

As to claim 24, Tennies et al disclose (fig. 2) the optical fiber (38) enveloping the electrical conductor (46-50) serves both for the coupling of the light of a possible arc as

well as for the transmission of other useful signals within the monitored piece of electrical equipment (64), (column 3, lines 45-57).

As to claim 25, Tennies disclose (fig. 2) that the light signals caused by accidental arcs and useful optical signals are differentiated with the help of reference curves filed in the monitoring and evaluating unit (64) for different types of accidental arcs, (column 3, lines 50-55).

As to claim 26, Tennies et al disclose (fig. 2) optical/electrical transformer (26) and light emitting components (46-50) present in the case of using optical fibers (38) for the transmission of useful signals are coupled by means of a clamping technique (plug, 44) for coupling an uncoupling light from the outside to the waveguide (38), wherein they are impressed into the waveguide (38) by a claw-like formation (wired directly to load) with projecting optically active elements (30), (column 3, lines 25-35).

As to claim 27, Tennies et al disclose (fig. 1, fig. 2) that information is exchanged between optical/electrical transformer (26) an monitoring and evaluating unit (62) via an electrical conductor (46-50) enveloped by an optical fiber (38), (column 3, lines 25-35, lines 50-57).

As to claim 28, Tennies et al disclose (fig. 2) that information is exchanged between optical/electrical transformer (26) and monitoring and evaluating unit (64) via power line (46-50) serving simultaneously for the power supply of the monitored piece of electrical equipment (34), (column 3, lines 27-29, lines 35-40, lines 54-58).

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DON WILLIAMS whose telephone number is (571)272-8538. The examiner can normally be reached on 8:30a.m. to 5:30a.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Don Williams/
Examiner, Art Unit 2878

/Georgia Y Epps/
Supervisory Patent Examiner, Art Unit 2878